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10/684,363	10/15/2003	Ravishankar Sankaranarayanan	TI-36179	3365

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EXAMINER	
SINGH, RAMNANDAN P	
ART UNIT	**PAPER NUMBER**
2614	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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	Application No.	Applicant(s)	
Office Action Summary	10/684,363	SANKARANARAYANAN ET AL.	
	Examiner	**Art Unit**	
	Ramnandan Singh	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) *14-16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13 and 17-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *Oct 15, 2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-13 and 17-24, drawn to a method of determining distance to an echo point, classified in class 370, subclass 286, as shown in Fig. 1B.

II. Claims 14-16, drawn to a DSL Access Multiplexor (DSLAM), classified in class 370, subclass 395.5, subclass 420, as shown in Fig. 1A.

2. Applicant's response filed on Jul. 9, 2007 confirmed the election of Group I consisting of claims 1-13 and 17-24. Further, claims 14-16 were cancelled by the applicants. Hence, this restriction is made FINAL.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Claim 5 recites "performing a XNOR operation" in lines 1-2. This feature is not

shown. Therefore, the XNOR operation must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claims 3 and 10 are objected to because of the following informalities:

Claim 3 recites the limitation, "corriparing said monitored sequence" in line 4. There is a typographical error. Replace the word "corriparing" with the word "comparing".

Claim 10 recites the limitations "**An** line card" in line 1 and "medium **.to** determine" in line 5.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-2, 8-9, 10-11, 17-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Lassaux et al [US 4,649,335].

Regarding claim 1, Lassaux et al disclose a method of performing a single determination of distance to an echo point in a wire-line medium (2), as shown in Figs. 1-2 [col. 1, line 4 to col. 4, line 18], the method comprising:

transmitting a first sequence of bits on the wire-line medium (2) [Figs. 1-2; col. 7, lines 6-19; col. 5, lines 39-45];

monitoring the wire-line medium to determine reception of the first sequence of bits as an echo from the echo point [Figs. 1-2; col. 7, lines 20-52]; and

computing a distance to the echo point according to a time taken to receive the echo after the transmitting, whereby the single determination is performed based on the first sequence of bits [col. 7, line 53 to col. 8, line 15].

Regarding claim 10, Lassaux et al disclose a line card (i.e. equipment) shown in Fig. 1, performing a single determination of distance to an echo point in a wire-line medium, the line card comprising:

a port (4) coupled to the wire-line medium (2);

means (8) for transmitting a first sequence of bits on the port [Figs. 1-2; col. 7, lines 6-19]; and

means (14) for monitoring the wire-line medium to determine reception of the first sequence of bits as an echo from the echo point [Figs. 1-2; col. 7, lines 20-52], wherein a distance to the echo point is computed according to a time taken to receive the echo after the transmitting bits whereby the single determination is performed based on the first sequence of bits bits [col. 7, line 53 to col. 8, line 15].

Regarding claim 17, Lassaux et al disclose a test processor (i.e. equipment) for performing a single determination of distance to an echo point in a wire-line medium (2), the test processor, as shown in Fig. 1, comprising:

an outbound interface (4) ;

a transmission block (8) causing the outbound interface to transmit a first sequence of bits on the wire-line medium [Figs. 1-2; col. 7, lines 6-19] ; and

an inbound interface (14) generating a monitored sequence based on a signal received on the wire-line medium [Figs. 1-2; col. 7, lines 20-52],

wherein the monitored sequence is examined to determine reception of the first sequence of bits as an echo from the echo point, and wherein a distance to the echo point is computed according to a time taken to receive the echo after the transmitting, whereby the single determination is performed based on the first sequence of bits [col. 7, line 53 to col. 8, line 15].

Regarding claim 18 , Lassaux et al further disclose the test processor comprising a signal generation (8) and monitor block (14) which receives data indicating a specific port (4) on which the wire-line medium (2) is connected, wherein the first sequence of bits are caused to be transmitted on the specific port [Figs. 1-2; col. 7, lines 6-19].

Regarding claim 2, Lassaux et al further disclose the method, wherein the first sequence of bits exhibits a good auto-correlation property, whereby the first sequence of bits exhibits a low correlation (i.e. cross-correlation) with the first sequence of bits shifted by one or more positions (i.e. delayed) [col. 4, lines 3-18].

Claims 11 and 23 are essentially similar to claim 2 and are rejected for the reasons stated above.

Regarding claim 19, Lassaux et al further disclose the test processor, wherein the signal generation (8) and monitor block (14) examines the monitored sequence to determine reception of the first sequence of bits [Fig. 1; col. 7, line 6 to col. 8, line 15].

Regarding claim 20, Lassaux et al further disclose the test processor, wherein the signal generation and monitor block receives the first sequence of bits and a data bit rate from an external system (9), wherein the first sequence of bits are transmitted at the bit rate [Fig. 1; col. 3, lines 39-61].

Regarding claim 21, Lassaux et al further disclose the test processor, comprising a parameters table (i.e. coefficients memory) (14) storing the first sequence of bits and the bit rate [Fig. 1; col. 3, lines 39-61].

Regarding claim 22, Lassaux et al further disclose the test

processor, wherein the signal generation and monitor block examines the monitored sequence to determine reception of the first sequence of bits as an echo from the echo point [Fig. 1; col. 3, lines 39-61], and computing a distance to the echo point according to a time taken to receive the echo after the transmitting, whereby the single determination is performed based on the first sequence of bits [col. 7, line 6 to col. 8, line 15].

Regarding claim 8, Lassaux et al further disclose the method, the computing comprises multiplying the time taken with a velocity value, wherein the velocity value corresponds to velocity of propagation of bits on the wire-line medium [col. 8, lines 5-15].

Regarding claim 9, Lassaux et al further disclose the method, wherein the wire-line medium comprises a local loop (1) [Fig. 1].

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 3-7, 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lassaux et al as applied to claims 2 and 11 respectively above, and further in view of Offord et al [US 5,550,528].

Regarding claim 3, Lassaux et al do not teach expressly comparing two sequences of bits using a bit-by-bit basis. However, this method is well-known in the art.

Offord et al teach a method of comparing an input pattern with a reference pattern on a bit-by-bit basis [Fig. 2; col. 2, lines 7-23; Abstract].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply the method of Offord et al with Lassaux et al in order to compare the monitored sequence of bits and the first sequence of bits on a bit by bit basis to provide an alternative method of correlating two sequences of bits.

Claim 12 is essentially similar to claim 3 and is rejected for the reasons stated above.

Regarding claim 4, Lassaux et al further teach the method, wherein the generating and the comparing are performed continuously such that the reception of echo can be determined accurately [col. 8, lines 5-15].

Regarding claim 5, Offord et al further teach the method, wherein the comparing comprises performing a XNOR operation [col. 2, lines 23-26].

Regarding claim 6, Offord et al further teach the method, wherein the generating comprises setting a monitored bit to a logical 0 if a voltage level on the wire-line medium is less than a threshold voltage and to logical 1 otherwise [col. 2, lines 26-34].

Regarding claim 7, Offord et al further teach the method, wherein the monitoring further comprises measuring a correlation factor (not shown) representing a number of matching bits encountered in the comparing [Fig.

2]. Alternatively, Lassaux et al disclose generating a correlation factor [col. 8, lines 26-41].

Regarding claim 13, Lassaux et al further disclose the method, wherein the wire-line medium comprises a local loop (1) [Fig. 1].

9. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lassaux et al as applied to claim 18 above, and further in view of Cooper [US 4,498,141].

Regarding claim 24, although Lassaux et al disclose using a reference signal x(n) formed by a pseudo-random sequence [col. 5, lines 40-45], Lassaux et al do not teach expressly using Barker codes to represent a reference signal (i.e. a first sequence).

Cooper teaches a high speed correlation circuit and method wherein the correlation word may be selected as a Barker code or any known pseudo-random sequence [col. 1, line 67 to col. 2, line 2; col. 1, lines 14-24].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply the Baker codes of Cooper with Lassaux et al in order to compare the monitored sequence of bits and the first sequence of bits on a bit by bit basis to provide an alternative method of representing a correlation word [Cooper; col. 1, line 67 to col. 2, line 2].

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(i) Vancraeynest [US 5,239,496] discloses a digital parallel correlator [Figs. 2-4; col. 7, lines 11-40];

(ii) Wolf [US 5,600,660] discloses a method for determining the number of defective digital bits using excusive-NOR functions wherein the sequence may be Barker codes [Whole document]; and

(iii) Hwa [US 4,041,381] discloses methods and equipment for testing reflection points of transmission lines [Whole document].

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ramnandan Singh whose telephone number is (571) 272-7529. The examiner can normally be reached on M-TH (8:00-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fan Tsang can be reached on (571) 272-7547. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ramnandan Singh
Examiner
Art Unit 2614